

REMARKS

The Examiner is thanked for the careful review of the application as set forth in the outstanding office action. Reconsideration of the application in view of the foregoing amendments and the following discussion is respectfully requested.

Claim Objections

Claim 39 is objected to as being of improper dependent form. Claim 39 has been amended, and is now in independent form, thus mooting the objection.

Claim Rejections - 35 USC Section 103

Claims 12-20, 23, 27, 39-42, 45-52, 54 and 58 stand rejected as being unpatentable over Korff et al. ("Korff") in view of Emery et al. ("Emery"). The rejection is respectfully traversed on the grounds that a prima facie case of obviousness has not been established, and the references do not describe, teach or suggest each of the features of the claimed subject matter.

Initially, applicants point out that both Korff and Emery are directed to systems for belling plastic pipe, and are not directed to systems for forming flared ends in flexible tubing. As noted, for example at paragraphs [0032] and [0033] of the specification, forming flared ends in flexible tubing presents a set of problems solved by the claimed subject matter. Working in plastic pipe is a different application with different problems from that of forming flared ends in flexible tubing.

Korff describes a belling system for plastic pipe, utilizing a heating station in which radiant heating elements are disposed above the pipes and a reflector is disposed below the pipes. As the Examiner notes, Korff does not disclose a heater having a contact heating structure. Emery is cited as allegedly disclosing "a heating station (91) with a contact heating structure with a contacting surface, or a heating

mandrel (Fig. 8, 199) for contacting and heating an entire circumference of an end of the tube (171) and wherein the remainder of the tube remains unheated." Applicants respectfully disagree that Emery discloses such heater.

In the Emery system, the pipe end being heated is not contacted by a heating surface, but is heated by an air flow depicted in Fig. 8 by the air flow arrows, and described at column 7, lines 42-57:

In operation, air within the heater is drawn into the heating mandrel bore 201 by the suction fan 197 and is discharged into the passage 193 as it moves across the heater coils 195. The air moves toward the right, as viewed in the drawing, between the inner tube 155 and the center tube 153 and is turned approximately 180.degree. in the opening between the inner tube and the entry tube 171. The heated air then passes to the left over the outer surface of a pipe end positioned within the heater, is turned 180.degree. around the leading end of the pipe, is drawn to the right along the inside of the pipe wall, and is then drawn to the left again into the bore 201 for reheating and recirculation by the fan 197.

The operation is also described at Emery, column 2, line 53 to column 3, line 4.

Further, Emery expressly teaches that the end of the pipe is not brought into contact with the heating elements, e.g. at column 3, lines 8-11 and at column 7, lines 57-60. The heating mandrel 199 does not contact the end of the pipe, as illustrated in Fig. 8, since the space between the mandrel and the inner surface of the pipe end is needed to allow the air flow which heats the pipe.

It is therefore clear that Emery does not describe a heater having the features of Claims 12, 39 and 42, for example.

The examiner asserts that it would have been obvious to modify Korff by providing the heater with a heating mandrel that directly contacts the end section of the pipe as taught by Emery in order to uniformly heat the end section of the pipe

and prevent it from collapsing during heating. As pointed out above, Emery not only does not teach contact heating of a flexible tubing or a pipe end, Emery teaches away from such contact heating.

For at least these reasons, the applied references Korff and Emery do not describe, teach or suggest the subject matter of the pending claims, and the rejection based on these references should be withdrawn.

In regard to Claims 13-16 and 46-49, the examiner asserts that Emery discloses a contact heating receptacle, and that it would have been obvious to modify Korff by providing each heating unit with a contact heating receptacle as taught by Emery to prevent heat lost to the surrounding during the heating process. However, Emery does not describe or suggest a contact heating receptacle as in the claimed subject matter, and accordingly the combination of references cannot render obvious the subject matter of these claims.

With regard to Claims 27 and 58, the examiner asserts that one skilled in the art would be motivated to provide Korff with a tube receptacle lockout, or an outer secure means as taught by Emery (161-183) to secure the pipe within the heating receptacle during the heating process. Applicants respectfully disagree that Emery provides this teaching or motivation. Elements 161 and 183 are support devices, and do not provide a tube receptacle lockout. Further, these claims have been amended to recite "a tube receptacle lock-out device to prevent insertion of a tube into one of said plurality of tube receptacles that is not to be used." Neither Korff nor Emery describe the features of these claims.

Regarding Claim 39, the examiner asserts that Korff's apparatus is capable of bellng tubes/pipes made of PFA, PVDF or FEP. Applicants respectfully disagree. Korff does not describe that the described system can be used to bell tubing made of PFA, PVDF or FEP, and particularly one in which the heater is configured to heat the surface to a suitable temperature range for pre-heating the plastic material of the end of the flexible tubing prior to compression forming of a flare. Moreover, neither

applied reference describes a contact heating receptacle, as discussed above regarding Claim 12.

Regarding Claims 40-41 and 45, applicants respectfully disagree with the assertion that the mandrel 72 of Korff is not actively heated or cooled. As described in Korff, e.g. at column 7, lines 24, the mandrel 72 is preheated prior to being forced into the heated end of the pipe.

The rejection based on Korff in view of Emery should be withdrawn.

Claims 21-22, 24-26, 43-44, 53 and 55-57 have been rejected as being unpatentable over Korff in view of Emery as applied to Claims 12-20, 23, 27, 39-42, 45-52, 54 and 58, and further in view of Corbett, Jr. ("Corbett"). The rejection is respectfully traversed, for the reasons discussed above regarding Claims 12 and 42, for example.

Further, Corbett does not disclose the features of Claims 21-22, 24-26, 43-44, 53 and 55-57. Claims 21 and 53 have been amended to recite that the system includes "at least a first mandrel spring mounted on the mandrel press to apply an axial spring compressive force to bias an axial position of the first mandrel relative to the mandrel press." Corbett's spring loaded detents 61 (FIGS. 7-12) appear to move radially, and do not bias an axial position of the mandrel relative to a mandrel press.

Claims 24 and 55 have been amended to recite that the system includes "a first mandrel spring mounted on the mandrel press by a spring applying an axial force on the first mandrel, and a second mandrel, rigidly mounted on the mandrel press." Here again, Corbett does not disclose a first mandrel spring mounted on a mandrel press by a spring applying an axial force on the mandrel.

Claims 25 and 56 have been amended to recite "the first mandrel positioned at its tube stop position by said spring." Corbett does not describe the features of Claims 25 and 56.

The rejection of Claims 21-22, 24-26, 43-44, 53 and 55-57 should be withdrawn.

Claim 35 has been rejected as being unpatentable over Korff in view of Emery as applied to Claims 12-20, 23, 27, 39-42, 45-52, 54 and 58, and further in view of Johansson et al. ("Johansson"). The rejection is respectfully traversed for the reasons given above regarding Claim 12. Further, Johansson describes coating a mandrel to make it smooth and slippery, and does not describe a contact heating receptacle as recited in Claims 12 and 35, wherein the contacting surface of the heating receptacle is fabricated of a material selected to prevent the tube end from sticking to the surface and prevent contamination of the tube.

Conclusion

The outstanding objection and rejections have been addressed, and the application is in condition for allowance. Such favorable reconsideration is solicited.

Respectfully submitted,

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